Oil Monopoly: a Market Process Analysis from the Austrian School

Ryan J. Wood
Austrian Student Scholars Conference
Grove City College
18-19 February 2011
Word Count: 15,125

This study was originally submitted in partial fulfillment of the requirements for the degree of MSc in International Management for MENA of the School of Oriental and African Studies (University of London), 15 September 2010.
Table of Contents

Introduction 5
1.0 Literature Review 8
  1.1 Ricardian View 8
  1.2 Marshallian View and the Neoclassicals 10
  1.3 Marxist View 12
  1.4 Frankel’s Theory of Oligopoly and its Adherents 13
  1.5 History of Monopoly Revisited 13
  1.6 The Austrian School 15
  1.7 Hypotheses 20
  1.8 Methodology 21
  1.9.1 Benefits of the Study 23
  1.9.2 Restrictions of the Study 24
2.0 Case Study 26
  2.1 The Breakup of Standard Oil 26
  2.2 Redline Agreement 28
  2.3 The Achnacarry Agreement 30
  2.4 Production in Iran 31
  2.5 Market Interventionism in the United States 33
    During the Great Depression 33
  2.6 The Formation of OPEC 37
  2.7 U.S. Interventionism in the Crude to the 1970’s 42
  2.8 The Crisis of 1986 and the Modern Oil Market 46
3.0 Discussion 49
  3.1 The Mengerian Theory of the Evolving Market 49
  3.2 Monopoly as a State Granted Privilege 51
  3.3 Reflections on Oil Policy for the Future 52
    3.3.1 Production Spare Capacity 52
    3.3.2 The Asian Market: Growing Demand in
    the 21st Century 54
Conclusion 57
Bibliography 59
Appendix 1.0 64
  1.1-1.6 67-69
  2 70
  3 70
  4 70
  5 71
  6 71
  7 71
  8 72
Abstract

This paper reassesses the theory of monopoly from its historical roots after assessing the flaws of previous economic studies on monopolies in the oil industry. It builds a theory in which the market gradually becomes more competitive over time from the Mengerian theory of the evolving market process and emphasizes the significance of monopoly as a state granted privilege. An historical economic case study is presented showing that the market process tends to become more competitive over time unless undermined through state intervention. This study concludes by highlighting its findings and analyzes its application to oil market policy progressing into the future. Arguing for more responsive deregulation and streamlined bureaucracies to address the main challenge that the market faces today: a lack of production spare capacity.

Acknowledgements
I would like to acknowledge the help of friends and family who helped solicit the enclosed questionnaire (Appendix 1) for completion, the Mises Institute for their generous work in building such an immense online collection of free literature, and my loved ones for their continued support.
Introduction

During the summer of 2010, the author conducted a questionnaire to assess respondents’ concerns about the oil industry (see Appendix 1.0). 53.7% of the respondents in 2010 (61% in 1979) view OPEC as being bad for America (see Appendix 1.1). They stated that their major concern in regard to energy was the degree of dependence on foreign states (see Appendix 1.2) and respondents were largely conscious to the degree to which the United States imports oil for consumption (see Appendix 1.3). Lastly, the respondents largely view oil companies as being responsible for high-energy costs and view government led initiatives for the development of alternative energies as being an important instrument to solve these problems (see Appendix 1.5 and 1.6 respectively).

In regard to the government taking a leading role in driving the market through various instruments of central planning and market intervention, the current American administration has notably been as proactive as any other by promoting subsidies for alternative energy (the Huffington Post 2009) and most recently through micromanaging the response to the May 20, 2010 Deepwater Horizon oil slick (Office of the Press Secretary 2010). For any proponent of the laissez-faire economy¹, both market interventionism and the growing expectation of it are both equally

---

¹ From the 18th century French ideal laissez faire, laissez passer (Mises 2008, p.725-727) meaning: to “let each individual choose how he wants to cooperate in the social division of labor; let the consumers determine what the entrepreneurs should produce” (quoted on p.726). Contrary to central planning where “the government alone (may) choose and enforce its rulings by the apparatus of coercion and compulsion” (quoted on p.726).
alarming. Therefore the general problems that will be assessed in this study are those concerning to oil consumers: the problem of what is perceived as subjectively high oil prices and corruption within the market (the most notable actors being oil companies, consuming nation states, and producing nation states). To further develop ideas on this topic we look at previous studies from the various economic schools of thought on the oil market.

There have been various studies written on the oil market suggesting corruption, a lack of market competition, and most notably the presence of monopolies. In the following pages we will assess some of these previous studies made concerning monopolistic practices from the (Section 1.1) Ricardian, (1.2) Marshallian and the Neo-Classical, and (1.3) Marxist schools of thought as well as (1.4) Frankel’s view of Oligopoly. From there an alternative view of monopoly will be constructed by looking at its original context from (1.5) English Common Law and (1.6) interpretations in the Austrian School of Economics. From this two (1.7) Hypotheses and (1.8) a Methodology will be formed building upon the Austrian theory of the market process. Last the (1.9.1) benefits and (1.9.2) restrictions of the study will be elaborated on.

In the second chapter, an historical economic analysis will be constructed looking at the evolution of the market process in the oil industry paying special attention to the (Section 2.1) Anti-Trust suit against Standard

---

2 The term consuming nation and producing nation stem from the fact that they have a negative or positive oil production balance respectively (Roncaglia 1985, p.80).
Oil, (2.2) the Redline Agreement, (2.3) the Achnacarry Agreement, (2.4) oil production in Iran, (2.5) the United States’ market during the Great Depression, (2.6) the formation of OPEC, (2.7) the United States’ market up to the 1970’s, and the legacy of (2.8) the Crisis of 1986. Special attention will be given in this section to analyzing the competitive evolution of the market and government’s role (or lack thereof) in promoting special privileges to various industrial actors.

In Chapter 3, a discussion will be presented analyzing the level of success of the hypotheses (Section 3.1 and 3.2) in predicting the evolution of the market process and how these results apply to the challenges faced by the oil industry today (3.3.1 and 3.3.2).
1.0 Literature Review

1.1 Ricardian View

In the Ricardian view, there are four types of monopolies; scale economies, patented processes, naturally scarce goods, and the monopoly of land. Monopoly occurs when production yields a surplus over cost or better put when an economic rent exists. This theory focuses on supply or cost conditions; not market demand conditions (O’Driscoll 1982, p.196). This acknowledges that every oilfield is unique; each field has its own physical makeup, its own sulfur and hydrocarbon contents. Each field has its own extraction costs and its own refining costs, its own geographical location which will determine unique transportation costs, and provides a source for a different basket of refined products (Roncaglia 1985, 28-29).

Under competitive conditions there is an incentive to exploit the least expensive and most profitable locations first going to the next most cost effective and profitable locations with each new production expansion. Any increase in production and transportation costs must immediately be connected to an increase in the price of oil (Roncaglia 1985, 29-31). This is

---

3 Specific gravity or relative density (a means of assessing hydrocarbon content) and sulfur content are perhaps the two most important features of crude (Fattouh 2006a, p.41) (See Appendix 2 and 3). Lighter crudes generally receive higher associated prices due to the relatively higher demand for their final refined products. Under the posted price system, an additional US$ 0.02 was added unilaterally by producers per degree of API gravity (Al-Janabi 1977) to account for the tendency for products yielded from higher API gravity crude to have a relatively higher market demand than products from lower API gravity crude. However, today the prices are determined by competitive bidding on the futures market based on the buying, selling, and speculative valuation of market forces. In both cases, higher API gravity crude tends to have a higher market demand.
otherwise known as the residual rent concept of Ricardian economics (Mises 2008, p.632-633).

This theory makes a strong argument for gradual increases in prices over time, but the theory creates a fallacy of assuming that less (and not more) economically exploitable oil will be discovered in the future.\(^4\) Now, this may be a true assumption in terms of exploiting proven oil wells, but it cannot be assumed true in regard for the exploitation of unproven or undiscovered oil wells or the preference of developing certain oil wells over another due to the market demand of specific refined products, (ex. heavy marine or industrial residual fuel oils versus light gasoline or naphtha) (Downey 2009, p.170). Also variances of local regulations and industry-associated taxes may make previously profitable wells unprofitable for exploitation or vice versa through subsidies, tariffs, or taxation (Roncaglia 1985, 29-31).

In the case where an oil company gains the right to develop a less economically exploitable field made more profitable through market interference, it may choose to fully exploit such a field and not exploit other (naturally) more economical fields. Furthermore firms often refrain from

\(^4\) Ludwig von Mises gave much credit to Ricardo for his work in developing the idea that marginal land does not yield rent and from this due to their focus on *real costs* Ricardo, nor others thereafter, were able to make the step in connecting this to the principle of valuational subjectivism. Mises attributes this to a misclassification and improper use of general lexicon like land and labor (Mises 2008, p.631-633). However, the theory of value and price is not based on such classifications, but based on “the distinction...between goods of higher and of lower orders” (quoted in Mises 2008, p.632).
fully exploiting more profitable fields immediately in order to use slower, stable rents to stabilize income while exploiting less profitable fields. This behavior has especially been common with large Middle Eastern oil fields, operated under the guise of consortia of large firms in order to avoid production shortages over time. Furthermore, there is debate that costs naturally raise over time due to the increased costs of exploration and production (E&P) due to discovery exhaustion. This argument does not take into account technological advances of the discovery process that would lower the real cost and promote future efficiency of exploration and production (Roncaglia 1985, p.28-31).

1.2 Marshallian View and the Neoclassicals

Marshall (quoted in O’Driscoll 1982, p.197) wrote in *the Principles* that “monopoly value” occurred when “a single person or association of persons has the power of fixing either the amount of a commodity that is offered for sale or the price at which it is offered.” Marshall seems to present a consistent assessment as Adam Smith in regard to monopoly value and of competition as “economic freedom” (cited on p.197), however the larger consensus among the neoclassicals diverge from Marshall’s connection to classical economic thought on monopolies. O’Driscoll explains this in the historical context of the greater importance of economic thought in 20th century policy making. For neoclassicals like Ely, the importance of land in the Ricardian sense was replaced by technological importance. This is
highlighted in Ely’s definition of a natural monopoly as “a pursuit...excluded from the steady, constant pressure of competition” (quoted in O’Driscoll 1982, p.197). We see a tendency of belief in economic schools today that competition is not sustainable on its own right, but needs to be sustained by outside forces. To this we see branches of the neoclassical school begin to incorporate varied degrees of support towards economic interventionism.

Arguing against the Ricardian view, Adelman wrote extensively that oil prices would naturally decrease over time due to increased availability of low cost oil and that this downward pressure would be strong enough to resist attempts to squash competition. Highlighting this view, he notes how the oil shipping industry is a purely competitive field; entry is cheap and quick and the industry has a vast amount of rival competitors (Roncaglia 1985, p.31-34).

The two common reasons attributed to how monopolies restrict competition are barriers to entry and predatory practices. Barriers to entry fail to explain this, first, because they often use lack of startup capital as a barrier. This cannot be identified as a barrier, but as a simple reality that capital is scarce. Secondly, this fails to explain how new entrants face costs not faced previously by preexisting firms. It is a given that start up firms face start up costs, but to say that this is a barrier is a fallacy and assumes away

---

5 Ludwig von Mises theorized that attempts of intervening in the economy must fail because of spontaneous market forces or these attempts must be exerted to a greater extent until the division between interventionism and socialism is non-existent (Lavoie 1982, p.170-171) because such intervention (p.180) “lead(s) to reactions that the intervener can neither specifically predict nor effectively prevent.”
the fact that all pre-existing companies faced start up costs at some point and that consumers may value stability of established firms (O’Driscoll 1982, p.199).

Predatory pricing theories overlook the fact that these plans cost the predator more than the victim and under the neoclassical view of the firm as a profit maximizer, such a scheme would be cost inefficient. It would make more sense to simply undergo a merger or acquisition of the smaller competitor, while saving time and costs lost by undergoing predatory practices. These claims are typically difficult or impossible to prove (Anderson 2003, O’Driscoll 1982, p.199). Lastly, the neoclassicals fail to address how monopolies enter into an open market in the first place.

1.3 Marxist View

Chevalier (1975 found in Roncaglia 1985, p.38-40) writes a theory based on the Marxist class struggle using Marshallian economics, contending that the oil industry produced a surplus (difference between final market prices and production costs), which the oil companies compete with producing countries in a struggle for control over those rents. This view however makes the same error that Adelman makes in his Marshallian approach suggesting that oil prices naturally rise over time due to oilfield exhaustion, whereas we see a trend for relative oil prices to decrease overtime in the real marketplace as competition and technological advancement occurs.
1.4 Frankel’s Theory of Oligopoly and its Adherents

Frankel claims that under competitive conditions an oil company will be able to increase its production capacity at a full level, but continues that the impossibility of a truly competitive market begs for either an intervening rationing system (for example the Texas Railroad Commission) or the formation of an oligopoly. Sylos Labini advanced Frankel’s theory by stating that technological barriers result in an inability of market entry of new firms. Frankel then continues to support the use of intervening forces into the market to curb monopolistic concentration of power and generally lacks any attention towards the possibility of producing countries’ abilities in extending influence on the market (Roncaglia 1985, p.34-36).

Roncaglia (1985, p.42-46) offers an alternative view of the oligopoly theory first presented by Frankel. Building upon this and the Labini theory of oligopoly, Roncaglia argues the existence of a trilateral oligopoly (oil companies, consuming countries, and producing countries), consisting of many individual agents (exerting pressure relative to their size) and those with limited pressure (forming coalitions) collectively have a prevailing influence on oil market prices.

1.5 History of Monopoly Revisited

The economic use of monopoly was only introduced into modern political-economic thought by Adam Smith. Prior to Smith, monopoly had a
long tradition as a legal concept, but throughout history its definition has been widely changed. Sir Edward Coke (quoted in O'Driscoll 1982, p.191) said that:

“a monopoly is an institution, or allowance by the king, by his grant, commission, or otherwise, to any person or persons, bodies politique, or corporate, of or for the sole buying, selling, making, working, or using any thing, whereby any persons, bodies politique, or corporate, are sought to be restrained of any freedom or liberty that they had before, or hindered in their lawful trade.”

This view was shared by William Blackstone (quoted on p.191-192) who said that a monopoly was “a license or privilege allowed by the king for the sole buying and selling making, working or using of any thing whatsoever; whereby the subject is restricted of liberty of manufacturing or trading which he had before.” This legal interpretation of monopoly has been the base of U.S. legal precedent. In the Charles River Bridge case, the U.S. Supreme Court defined monopoly as “the withdrawal of that which is a common right from the community and vesting it in one or more individuals, to the exclusion of all others” (quoted on p.192).

Reiterating monopoly as a state granted luxury, Parliament ruled in the Statute of Monopolies 1624 that Parliament had the right over the Crown to grant monopolistic privileges. Parliament’s claim was overturned and the Crown was restored with the power to grant monopolies. The main issue at stake was the issue of who had the right in allotting privileges and not in the justification of such rights. It was not until laissez-faire or classical liberal
thought emerged that laws of such privilege began to be challenged and eventually overturned (O’Driscoll 1982, p.192).

1.6 The Austrian School

In F.A. Hayek’s *Constitution of Liberty*, the Nobel Laureate wrote briefly on the subject of monopolies, describing them as a “minor problem” and viewed the existence of organized trade unions as a greater threat to liberty than a monopoly (in terms of market share position) (Hayek 1960, p.264-266, Shand 1984, p.125). Mainstream economic schools of thought regard monopolies as sharing specific features of control over price or output, a divergence between marginal cost and price, a contrast from perfect competition, what are perceived as excessive profit levels, and a reduction of freedoms of choice due to coercion. Monopolies are viewed as developing from the ownership of important resources, the use of patent rights or other legally protected barriers to competition, and most importantly through the increasing size of the firm as a dominant actor in the market. This leads ultimately to barriers of entry to competitors into the market (Shand 1984, p.125-126).

The Austrian School critiques these views as being flawed. Perhaps the most important aspect of any market is the process of discovery, which is not diminished with the presence of a monopoly (Kirzner 2000, p.15-19). Mises goes on to write (cited in Mises 1998, p.1), that “the monopolies we have to deal with are not absolute monopolies”, meaning that the state acts
as the only owner of all forms of production, but rather we see incomplete or partial monopolies where competition still exists. Commodities as, Mises says, even have their substitutes (Mises 1998, p.1-2), corn has wheat just as coal has oil to compete with and the degree of competition available in any market is a large factor in determining monopoly prices.

Despite a dominant market position, the neo-classical view of a monopolist must still discover what their customers demand in order to continue its dominant market role. A consequence of the detrimental view of monopoly is that there must be an instrument used to curb the act of being a monopolist or to correct the flaw in the market and thus restore competition. Contemporary economic schools largely agree on varying degrees of state intervention in order to achieve this goal. Here is where the Austrian School is the most critical of other economic philosophies. In their view the state is the sole arbiter of monopoly power. Mises (quoted in O'Driscoll 1982, p.205) goes so far as to say:

“the monopoly problem...is not an outgrowth of the operation of the market economy. It is a product of purposive action on the part of governments. It is not...inherent in capitalism as the demagogues trumpet...on the contrary, the fruit of policies hostile to capitalism and intent upon sabotaging and destroying its operation.”

There is not one unique definition of a monopoly in the Austrian writings, it must be reiterated that what the mainstream economists regarded as the dangers of the dominant firm monopoly, the Austrians minimized. From their writings, there are four possible definitions of what a
monopoly constitutes. The first is derived from the actual meaning of the word monopoly: being a single seller of a good. However, this is inappropriate in its application on three levels. First, a single seller of a product or total market dominance does not occur in reality. Second, one can easily characterize any good that is slightly different than another (in regard to packaging, after sales service, or location available) as a monopolized good (Shand 1984, p.125-127, O'Driscoll 1982, p.209). Third as Mises pointed out previously, even under this circumstance, the market offers goods that may replace the monopolized good and thus offer a potential profit opportunity if the would be monopolist raises costs to the point where the alternative product becomes cost efficient.

Hayek continues to discredit the neo-classical dominant firm definition of monopoly by stating that it is “neither desirable nor possible that every commodity or service...should be produced by a large number of producers...as a rule there will exist at any one time...special advantage of skill, location, traditions, etc. which only some but not all enterprises will possess” (Hayek 1979, p.66). The threat, itself, of competition from new market entrants is what keeps these existing producers from forming a monopoly (as Hayek measures in this example by fixed prices) because this would open up a potential situation for a competitor to price a competing product marginally lower than the monopolist (Hayek 1979, p.66-67).

Secondly, Mises and Israel Kirzner have established a variant of the “property rights” view towards a monopoly. In this approach a monopoly
exists when “the whole supply of the monopolized commodity is controlled by a single seller or group of sellers acting in concert” (Mises quoted in O'Driscoll 1982, p.204) to restrict production and increase prices (Shand 1984, p.127). Kirzner goes further to distance himself from the neoclassical definition of monopoly based on the principles of market and price equilibrium, but rather in regard to the “blockage of the competitive process” (O'Driscoll 1982, p.205). The property rights definition of Mises-Kirzner, like the neoclassical definition of monopoly, does little to address how monopolies are created (p.205). Furthermore, Murray Rothbard rejected this view because the term competitive price is completely subjective to the individual and therefore impossible to determine objectively what such a competitive price should be (Shand 1984, p.127).

The third definition, deriving from its historical legal application, is that the term “monopoly” is applied to direct or indirect governmental grants of privilege and that monopoly control over a market is fundamentally fragile to collapse unless given such preferential and protected status by the state. Shand (1984) notes that this third definition is comparable to the original definition of monopoly under English common law. Under this legal interpretation, collusion is considered to be a collection of individuals that make up a monopoly or cartel. However, collusion cannot be said to be outright malicious. One can easily argue that any joint venture, when two competing firms combine resources to maximize profits and minimize risk exposure, is an act of collusion, but when this act results in better efficiency
and lower and not higher prices for the consumer, then society as a whole is all the better for it (Shand 1984, p.127-128). It is only when collusion is combined with state granted privilege, which eliminates competition, when it can be to the consumer’s disadvantage.

Carl Menger had another view of monopoly, which was not fully developed by his pupils. Menger viewed the concept of monopoly as a part of the natural evolution of the market. He argued that the market develops into gradually more competitive stages, from that of a bilateral monopoly, to a multiparty trade market, and finally becoming a large-scale competitive market.

Bilateral Monopoly ‘→’ Multiparty Trade ‘→’ Competitive Market

Menger’s view addresses one of the large questions raised by other contending monopoly theories; that market forces break down monopolies. The key tool that a monopolist uses, undersupplying the market, is what empowers a competitor to seek to challenge the monopolist’s control of the market (O'Driscoll 1982, p.206-208).
1.7 Hypotheses

It is the Mengerian definition of monopoly and the evolution towards competition that serves the most unique and interesting concept to elaborate on in this study and one, which will be the major focus of this work. We then hypothesize that:

(1) The (oil) market naturally evolves and becomes competitive over time. And building on the concept of monopoly as a state granted privilege,

(2) A monopolistic control of the market will be broken in the absence of state protection.

The study then predicts that the Mengerian concept of monopoly to naturally exist in the infancy of a market and that without the presence of intervening forces (state intervention) from stopping competition, (Menger quoted in O’Driscoll 1982, p.208) the “economic progress of civilization”, also known as the discovery process will lead to competitive growth. This is built on the Austrian theory of human action stating that by nature humans engage in activities believed to improve upon their current conditions (whether correctly or incorrectly doing so). In the absence of complete self-sustainability, the individual must enter into transactions between others and thus creating the basis of the market process. By engaging in such voluntary exchanges the individual seeks to make their offered good more
advantageous than others in order to economize their labor (Bosch 1990, p.78-83).

The reason why an individual engages in such activity is due to the recognition of the existence of a problem and the imaginative means of developing a solution and economizing its use. This is the very nature of the competitive process and the Austrians theorize that this results in evolving markets because the evolutionary act (if demanded by market forces) will become a repetitive process and lower production costs over time. This makes capital less scarce and frees it to be invested in other sectors of the market, thus expanding the market (Bosch 1990, 83-85).

When applying this theory to a specialized industry, like the hydrocarbon industry, we can hypothesize an expected tendency of more competition over time. Alternatively, in the absence of competitive growth, we can predict that either market restrictions are being implemented or there is not adequate demand to necessitate new market entrants.

1.8 Methodology

To assess the two accommodating hypotheses, we will establish a historical economic analysis of the evolution of the market. This requires us to analyze the market from two specific angles. First, we have an issue of finding observable instances of market control. In the second issue we are observing a natural market progression over time. This requires us to observe a single market over various periods in its history to measure its
level of competitiveness. In the Mengerian sense, we need not seek to label a market as monopolistic or competitive, because there is no simple way of categorizing this, but rather classify the market conditions periodically throughout its history and record observations of the market becoming more or less competitive over time or remaining the same (O’Driscoll 1982, p.207-208).

In order to satisfy both needs, the author has selected several key events in which historians have focused a great deal of literature spanning the history of the oil market in the 20th century. The events include, the Breakup of Standard Oil, the Redline Agreement of 1928, the Achnacarry Agreement of 1928, the development of oil production in Iran, the United States oil industry during the Great Depression, the empowerment of OPEC, the United States oil industry in the 1970’s, and the oil crisis of 1986. The use of these events is important for several reasons. First, this gives us a sample of events involving existing market players as well as new entrants. Secondly, the use of the market from 1930-1970 and post-1970 allows us to analyze two widely criticized eras of market control: the Texas Railroad Commission era and the OPEC era. The nature of analyzing both regimes allows us to look at two similarly organized price and production determining regimes, however, the former had legal control (state control) and the later was a collective of sovereigns (lacking central state control). We can use these two regimes to test the hypothesis of monopoly as a state granted privilege. Lastly, the historical progression of the events allows us to observe the
market evolution in order to test the theory of competition increases over time.

### 1.9.1 Benefits of the Study

The benefit of this study on the Austrian view of the market process is that it analyzes the market in a way that other economic schools do not do. The Austrian method treats individuals as active instruments in search of consciously sought after goals and focuses on the heart of commerce as a product of human interaction (Prychitko 1994, p.77-79). This study combines historical observation with praxeological truth. As Ludwig von Mises wrote in *Human Action*,

> “the study of history makes a man wise and judicious. But it does not by itself provide any knowledge and skill which could be utilized for handling concrete tasks...historical experience as an experience of complex phenomena does not provide us with facts in the sense in which the natural sciences employ this term to signify isolated events tested in experiments. The information conveyed by historical experience cannot be used as building material for the construction of theories and the prediction of human events. Every historical experience is open to various interpretations, and is in fact interpreted in different ways” *(Mises 2008, p.30-31)*.

We have so far seen an overview of how the historical narrative of the events later presented in this study have been presented in different ways; through the lenses of the Ricardian, the Marshallian, the Marxist, and the Neoclassical eyes. In each of these narratives different blame is placed on what is
perceived as the imperfection of the market and what is viewed as subjectively high oil prices as a result.

However, it is the hope of the author that this historical study will, as Mises stated, become “intelligible only through an interpretation in terms of theories previously developed from other sources” (Mises 2008, p.31). From sources making the case for unhampered markets and the freedom of humans to act in purposeful endeavors in the pursuit of self-promotion and happiness. Through this, the study gives a unique understanding on the nature of market development as product of human action and a unique understanding of the necessity of unimpeded competition for this development to continue.

1.9.2 Restrictions of the Study

The main restriction of the study is the simple fact of limited cases of observation. Ideally, it would be more beneficial to have more cases of observation, but to do so would require a cross-industry analysis of multiple sectors and the time constraints in this study prohibit that from occurring. Additionally, the overall added benefit of such further analysis would come at a disadvantage to the clarity and focus of the overall study. With that in mind the author has decided to focus only on the chosen events within the study.

There have been criticisms of the methodological process of praxeology, or the logic of action from mainstream, empirically based economic schools (Hoppe 2007, p.8-10). The Misesian style of assessment of
“rigorous logical (deductive) justification” (quoted in Hoppe 2007, p.8) is unique to its adherents. Other, empirically based, economic schools regard economics as a hard science like physics that require constant empirical testing. However, as Jean Baptiste Say was quoted on the style of Ludwig von Mises (quoted in Hoppe 2007, p.10-11):

“a treatise on political economy will...be confined to enunciation of a few general principles, not requiring even the support of proofs or illustrations; because these will be but the expression of what every one will know, arranged in a form convenient for comprehending them, as well as in their whole scope as in their relation to each other” and “political economy...whenever the principles which constitute its basis are the rigorous deductions of undeniable general facts, rests upon an immovable foundation.”

The criticisms of Mises's methodology seem to be highly overdramatized by its critics. Hans-Hermann Hoppe wrote in his book Economic Science and the Austrian Method on the influence Mises has had on mainstream economic thought. He wrote that such a highly regarded economist as Lionel Robbin's was greatly influenced by Mises and that his book The Nature and Significance of Economic Science (1932) "is nothing but a somewhat watered-down version of Mises's description of economics as praxeology. Yet it was respected by the economics profession as the guiding methodological star for almost twenty years" and “in his Preface, (he) explicitly singles out Mises as the most important source of his own methodological position” (Hoppe 2007, p.12).
2.0 Case Study

2.1 The Breakup of Standard Oil

The 1911 breakup of Standard Oil, under the confines of the U.S. Sherman Anti-Trust Act, established the framework for the modern oil industry that would control production and pricing practices for the greater part of the 20th century. One cannot continue without first pointing out the irony of the Congressional decision to break up Standard. The fact that government intervention is able to establish rulings for preferential treatment in industry shows the extent that 20th century political practice and economic thought have diverged from the original interpretation of monopoly as a government given privilege. The decision to breakup Standard was in itself a government granted privilege. The split of Standard Oil established 34 oil companies, notably among these companies were 3 of the Seven Sisters (Standard Oil Co. of New Jersey, SoCoNY, and SoCal).

If going on the given information alone one could argue that the anti-trust measures of government worked; that they made the market more and not less competitive. Thirty-four companies surely must create more competition in the market than one single company. However, when you look

---

6 John McGee shows evidence brought against Rockefeller and Standard Oil to be fabricated by his failed competitors. McGee writes (1975, p.403 and cited in Lepage 1978, p.36) that “judging from the Record, Standard Oil did not use predatory price discrimination to drive out competing refiners, nor did its pricing practice have that effect...I am convinced that Standard did not systematically, if ever, use local price cutting in retailing, or anywhere else, to reduce competition.”

7 The Seven Sisters was a group of international oil companies (IOC’s) that dominated the global oil market until the 1970’s (Downey 2009, p.9-11).
closer at the remnants of the former Standard Oil Empire, voting rights in the now publicly traded companies still largely remain under control by the Rockefeller family. Through Chase-Manhattan’s direct holdings, it was the 4th largest shareholder in Exxon in 1985. However, through cross-shareholding with Citibank and other financial groups, the Rockefeller group becomes the largest indirect shareholder of Exxon through Chase, 2nd through Morgan Guaranty, 3rd through Manufacturers Hanover, and 5th through Citibank. A similar indirect control through financial holdings exists through other former branches of Standard Oil, including Mobil, Texaco, and Chevron (Roncaglia 1985, p.69-71).

The lawsuit brought against Standard Oil was intended to restrict their accused role as a monopolist, which was viewed as prohibiting the entry of new competitors. However, the result of the case only superficially changed the company while ownership of the new bodies remained the same. The lawsuit effectively strengthened Standard's role in the market. The company entered into litigation as a monopolist accused of creating illegal barriers to entry for competitors and exited the proceedings only aesthetically modified, punished and subsequently cleansed of wrongdoing, all the while giving up no real power to the plaintiff.
2.2 Redline Agreement

In 1914 the British and Dutch governments made an agreement with the Turkish Petroleum Co. (later to become the Iraq Petroleum Co., IPC) not to engage in oil interests in the region without going through the IPC. The U.S. initially had little interest in exploration in the Middle East. This changed during the World War I, when the United States Senate initiated national security directives to secure a foothold in the international oil market and deviate a possible foreign market dominance of oil control. U.S. based oil companies (led by Standard Oil of N.J, or Exxon) were unable to secure entry into many foreign markets where major discoveries in the 1920’s were being made (India, Dutch East Indies, Iran, among others). This can only be attributed to the policies being implemented by the British and Dutch governments to promote their respective national oil companies inside of their respective colonies (Blair 1976, p.31-34).

The state granted privileges (or restrictions depending on the perspective) implemented under the auspices of the British Mandate were eventually challenged by the United States. The result of this challenge resulted with the British granting U.S. oil companies a gesture of good faith with exploration rights in modern day Iraq. The U.S. successfully argued that both Britain and the United States were on the winning side of WWI and therefore were entitled to concessions. Like the case of the Statute of Monopolies 1624 (from chapter 1), the challenge by the U.S. government on behalf of its respective oil companies, although initially based the argument
supporting the pro-market freedom for any bidder to enter into the Middle Eastern concessionary market, resulted in simple legislative clarification over who’s right it would be to grant such privileges. The U.S. government and oil companies simply withdrew their complaint because they were included in the oil insiders club (Blair 1976, p.31-34).

The resulting agreement carved out a map enclosing Turkey, Iraq, Saudi Arabia, and the sheikdoms of the modern day United Arab Emirates, Qatar, and Bahrain into a zone where International Oil Companies, or IOC’s, had to go through the Iraqi Petroleum Co. to set up concessionary agreements. IPC ultimately had veto power for any concessionary bid because, despite concessions being granted on a competitive bidding process, the IPC was allowed to outbid any potential lessee at no cost. IPC essentially acted as buyer and seller at a single time, thus nullifying the open market concept.

The Redline Agreement, however, excluded Kuwait, where oil fields were leased out on twenty-year concessionary agreements to British Petroleum and Gulf, and Exxon and Shell (Gillespie 1995, p.6). It also excluded Mandate Palestine (modern day Israel and the Palestinian territories), and trans-Jordan (Blair 1976, p.31-34). The fact that Kuwait was excluded in this and other agreements serves later significance when oil production began to tighten up in the 1970’s.
2.3 The Achnacarry Agreement

Until World War I, the use of oil was used predominately for lighting, as kerosene had replaced whale oil for lighting circa 1860. However with the technological advancement of the automobile and residual fuel powered (rather than coal powered) sea vessels, a new market for light and heavy distillates was created (Downey 2009, p.1-6, 170). The use of oil to fuel naval vessels was, however, the more influential reason why government interest in securing stable oil sources developed\(^8\). By the end of WWI, the global oil market narrowly avoided scarcity, but this led the major world powers to emerge from the war with the interest in securing permanent access to international oil reserves because of fears of eventual domestic production decline (Blair 1976, p.31-34).

By 1928, the global oil market had recovered from the shortage scares from WWI. Explorations during the 1920’s proved that global oil supply was in fact ample and American and British oil companies became fearful that oversupply could create periods of extreme supply glut and collapsed prices like what were seen in the United States in the 1860’s-70’s. To confront this fear the leaders of Anglo-Persian Oil (BP), Standard Oil of New Jersey (ExxonMobil), Gulf Oil (now part of Chevron and BP), Standard Oil of Indiana (later became Amoco, now BP) attended a grouse shoot in Achnacarry Castle in Iverness, Scotland, hosted by Henri Deterding of Royal Dutch Shell. During

\(^8\) Winston Churchill’s decision as commander of the British Navy to replace a slow, coal-burning fleet with a faster, oil burning fleet changed oil to a strategic military commodity (Downey 2009, p.6).
the retreat, the leaders established the As-Is Agreement or Achnacarry Agreement (Downey 2009, p.3, 8-9).

The agreement was an attempt for the included parties to enter into a series of joint ventures and redistribution of supplies between one another to keep members’ market ratios even at 1928 levels and to develop new production capacity based only on estimated market growth. Despite being an apparent case of collusion, the agreement was only enforceable by the threat of being excluded or kicked out of the group. It was a voluntary exchange lacking any enforceability (Bamberg 1994) outside of committee monitoring from its London office. The Achnacarry and Redline Agreements helped create an environment where Major Oil Companies were able to vertically integrate into the market without the fear of nationalization of resources. Governments that attempted to defy this, like the Mexican nationalization of 1938 or Iran in 1951, found themselves owning resources without access to markets for distribution. It wasn’t until the emergence of new, Independent Oil Companies, IOC’s, into the oil market that the collusive agreements of the early market players could be underbid and effectively challenged through competitive practice (Gillespie 1995, p.6-7).

2.4 Production in Iran

Oil was discovered in Iran in 1908, after seven years of exploration by a British businessman turned prospector. By 1913, Iranian production averaged 5,000 barrels/day. The British government bought 50% of the
Iranian oil company’s shares for £2,000,000 and renamed the company Anglo-Iranian Oil Company (AIOC, later to become BP) (Ghanem 1986, p.9).

On October 22, 1947, the Iranian Majlis (a sort of elder common to Middle Eastern society, but in contemporary Middle Eastern politics the term has been adopted as a parliamentary or legislative position) voted 102-2 in favor passing a single article (5 clause) law rejecting a Soviet proposal for a Soviet-Iranian oil company and paving a legal means for a future oil sector nationalization. Clause E of the new law stated (quoted in Anonymous):

“"In all cases where the rights of the Iranian nation in respect of the country’s natural resources, whether underground or otherwise, have been impaired, particularly in regard to the southern oil, the government is required to enter into such negotiations and take such measures as are necessary to regain the national rights and inform the Majlis of the result” [emphasis added].

The law was passed to make the unwillingness to grant oil concessions to the Soviets by Prime Minister Qavam al-Saltana appear like a failure of the democratic process of the Majli legislature. It was important to present this façade because the Soviets were using the presence of a standing army inside Iranian boarders and using political upheaval, which resulted from supporting the Azerbaijani nationalist movements to pressure the Iranians into complying with their demands. Al-Saltana added the phrase ‘particularly in regard to the southern oil’ to make the law appear non-biased towards the Soviets, although the law was written specifically for Soviet discrimination. After competitive negotiations, rivals Royal Dutch Shell, SoCoNy (both in the Southern Provinces) and Standard-Vacuum (Northern
Provinces following Russian withdrawal) would receive oil concessions (Anonymous).

Despite the nationalization of AIOC by Prime Minister Mussadeq (1951), the Iranian state found it exceedingly impossible to market the oil due to an effective blockade by the concessionaires affected and through their successful litigation brought against Japanese and Italian Independents moving the Iranian oil from their concessionary zones. The resulting decline of rents received by the Iranian government during the blockade nearly bankrupted the country and gave a clear warning to other new sovereigns (like the Colonel Qassam led coup of Iraq in 1958 or the later Iraqi governments following the passage of Law 80 reserving the right of nationalization) not to challenge the status quo (Gillespie 1995, p.7-8).

2.5 Market Interventionism in the United States During the Great Depression

A major oil discovery was made in East Texas in 1930. The resulting supply increase caused U.S. oil prices to fall from around US$1 a barrel or US$ 10.95 in 2009 to US$ 0.10 a barrel or US$ 1.11 in 2009 (Downey 2009, p.8). In the midst of the Great Depression, economic interventionist President Herbert Hoover⁹ began many series of central planning over the economy.

⁹ Many pro-interventionist historians today falsely label Hoover as a laissez-faire president. There have been many publications from within the Austrian camp to point this fallacy out and correct the widespread misinterpretation. Murray Rothbard largely discredits the laissez-faire argument in his book *America's Great Depression* (Rothbard 2000) as does Robert Murphy's *The
Some of these acts include propping up and maintaining wage rates when market forces otherwise would have deflated them, and drastically expanding public works, raising Federal Tax rates from 25% (for the top tax bracket for married filing jointly: over $100,000 in 1931) to 63% (for the top tax bracket for married filing jointly: over $1,000,000 in 1932, or 53% for a comparable $100,000 income to the 1931 rate) crippling international trade through the passage of the Smoot-Hawley Tariff (1930)\textsuperscript{10}, raising wages for government employees, and appropriations for naval expansion (Murphy 2009, p.27-59, Rothbard 2000, p.280-283).

Individual states moved in to exert extensive control over the oil industry by passing laws to regulate production levels. This reactionary governance was an attempt to maintain relatively high oil prices after new Oklahoma crude discoveries resulted in falling oil prices from US$ 1 per barrel to US$ 0.2 ½ per barrel. Oklahoma Governor Murray ordered the shut down of production until prices recovered to US$ 1.50 p/barrel. Gov. Murray went so far as to use the Oklahoma National Guard to force the mandate onto non-complying oilfields. Crude producing states, Texas, California, and Kansas all followed Oklahoma’s lead in passing “conservation” laws. Producing states then centralized their control over the American oil industry by establishing a committee of the Federal Oil Conservation Board.

\textit{Politically Incorrect Guide to the Great Depression and the New Deal} (Murphy 2009).

\textsuperscript{10} The Smoot Hawley Tariff of 1930 not only imposed high taxes on Americans who purchased foreign goods, but also lead to foreign states imposing their own tariffs on American goods; thus decreasing American exports during the Depression (Murphy 2009, p.43-44).
to bureaucratize state quotas on a national level. This de facto nationalization created a small black market of oil producers who tried to exceed the quota system and sell “hot oil” illegally (Rothbard 2000, p.283-284).

Hoover further exerted control over the oil industry by canceling drilling permits through the use of public domain and outright political pressure for oil producers to curtail production. Despite being started at the state level, Rothbard (2000, p.283-284) argues that Hoover shows his approval of the intervention in his December 8th, 1931 address to congress where he said:

“Particular attention should be given to the industries founded upon natural resources, especially where destructive competition produces great wastes of these resources… in recent years there has been continued demoralization in the bituminous coal, oil, and lumber industries. I again commend the matter to the consideration of the congress” (emphasis added) (Hoover, 1931).

The Federal budget of 1932 included a tariff on crude imports. This had three effects on the oil industry, it (1) lowered the amount of imports by adding higher costs to trade oil with the United States, (2) it lowered the amount of oil exports abroad by creating an environment where the U.S. had to consume the limited amount of overpriced oil that it was producing, and (3) it strengthened the U.S. state control over the oil industry.\footnote{Rothbard notes the irony of imposing import restrictions. If the proposed trade restriction was truly for the purpose of conservation of domestic resources, surely an incentive to consume \textit{more} and not \textit{less} foreign supplies should have been in order (Rothbard 2000, p.283-284).} This created the environment where Texas Railroad Commission was given the authority
to effectively regulate oil production and therefore oil prices (Rothbard 2000, p.283). For the next 40 years the Texas Railroad Commission (TRC) would become the global arbiter of oil prices (Downey 2009, p.9).12

The system began to strain in the 1950's, partially due to intervening pressure from consuming nations to lower posted prices13 as well as the reduction of prices naturally through crude surplus.14 The price cuts of the 1950’s did not affect IOC’s overall revenue stream because the increase of production was greater than the overall decrease in prices, however, receipts for producing countries decreased (See appendix 4). These revenue reductions (see Appendix 5) were widely cited as a reason for the creation of petroleum organizations like OPEC and its predecessor the First Arab Petroleum Congress (Ghanem 1986, p.18-21).

12 Netback-pricing was periodically adjusted between 1931 and 1971, due to political bargaining. The Gulf Price Formula priced crude globally at the same levels, adjusted for freight shipment distances from the Gulf of Mexico (Downey 2009, p.4-10, Ghanem 1986, p.12). This was adjusted in WWII to allow a Dual Basing Point at the British Naval crude shipment point, Ras Tanura, to avoid German Naval attacks and close a phantom tax for Middle Eastern crude arriving there. In 1948, the Price Shed Formula was created when price differentials between the dual basing points began to noticeably grow. The price-shed point was then moved from Malta to the United Kingdom to keep the price connection between the Gulf of Mexico and the U.K. (Ghanem 1986, p.12-17).

13 The Economic Cooperation Administration pressured IOC’s to reduce Middle East oil prices by US $0.23 per barrel in 1949 in anticipation of Middle Eastern host countries adopting the 50/50 concessionary agreement as what had just occurred in Venezuela (Ghanem 1985, p.17-18).

14 Soviet crude began to be sold in Western markets at discount rates as well as surplus in the Middle East due to increased production and a boom in oil tanker production as a response to Suez Canal closures during the Suez Crisis of 1956. By the time the canal was reopened, tanker prices collapsed due to a surplus of tanker vessels available in the market (Ghanem 1986, p.18-21, 72-73).
2.6 The Formation of OPEC:

The emergence of the Organization of Petroleum Exporting Countries (OPEC) can be said to be resultant of a combination of market conditions, a difference of the subjective value of crude between consumer and producing nations, and a general digression from colonialism to independence combined with extended periods of economic protectionism\textsuperscript{15} (highlighted by the Libyan Revolution). The price cuts of the 1950’s led to a general dissatisfaction of rents received by producing nations, however the market conditions by the 1970’s changed in a way where the old pricing regime could no longer sustain itself and Independents were able to challenge

\textsuperscript{15} During the Ottoman Empire, the majority of the Middle East and North Africa region fell into a single economic entity. Historical Palestine/Eretz Yisreal served as a major trade route linking modern Turkey, Transjordan and the East, the Arabian Peninsula, Egypt, and North Africa to the South and Southwest. Cairo was directly connected to Turkey through rail services via Gaza, Jaffa, and Haifa. After the collapse of the Ottoman Empire, new nation states emerged under different British or French influence and historical trade routes collapsed. During World War II, rail routes between Egypt and Mandate Palestine run by the Middle East Supply Center were used explicitly for the Allied war effort against the Axis (Wilson 1977, p.91-92).

As the mandate period ended and Israel emerged, the subsequent Arab economic boycott of Israel rendered the miniscule remnants of the Ottoman trade routes irrelevant, which harmed all parties concerned economically and politically. Jordan became reliant on the overcrowded Beirut port via Syrian land routes and the bay of Aqaba for western directed trade. Syria and Lebanon were cut off from North Africa, and Israel was isolated from potential inter-regional trade partners (Wilson 1977, p.92). This has had an effect on the policy makers in the region to adopt inward looking protectionist economic policies. Despite an abundance of bilateral and multilateral trade agreements signed (Euro-Mediterranean Agreement, GCC established 1981, Arab Maghreb Union established in 1989, Arab Maghreb Union established in 1989, to name a few) (Dennis 2006, p.21), both inter and intra-regional trade remained small until the late 1990’s due to consistent, inward looking and statist policies (Dervis 1998, p.3).
Majors in a way unable to do before (as described in section 2.4). OPEC is an inter-governmental organization established in 1960. Headquartered in Vienna and modeled after the TRC system\textsuperscript{16}. The main goals of OPEC can be summed up in Article 2 of the OPEC statute approved at the January 1961 conference, which states that:

”(A) The principal aim of the Organization shall be the coordination and unification of the petroleum policies of member countries and the determination of the best means for safeguarding their interests, individually, and collectively.

(B) The organization shall devise ways and means of ensuring the stabilization of prices in international oil markets with a view to eliminating harmful and unnecessary fluctuations.

(C) Due regard shall be given at all times to the interests of the producing nations and to the necessity of securing a steady income to the producing countries; an efficient, economic, and regular supply of petroleum to consuming nations; and a fair return on their capital to those investing in the petroleum industry” (OPEC, 2010).


The structure of the organization is like that of many inter-governmental organizations with a governing body and a main body represented by individuals appointed by the member states. In the case of OPEC the former is the board of governors represented by nominated individuals by their host countries and confirmed by the

\textsuperscript{16} OPEC was founded by Saudi Arabia, Kuwait, Iran, Iraq, and Venezuela. The United Arab Emirates, Qatar, Libya, Algeria, Nigeria, Angola, Ecuador, Indonesia, and Gabon (Indonesia and Gabon have since withdrawn membership) have since joined. Sudan is currently seeking membership (Downey 2009, p.11).
conference. Their role is to manage the affairs of the organization and implement decisions made by the conference. Ultimately their level of effectiveness is dependent on the level of harmonization between oil ministers of the member states, which often makes their duties effectively redundant. The OPEC secretariat is the main body of the organization that carries out executive functions (Ghanem 1986, p.38-39).

Unlike the TRC system, the structure of OPEC lacks any absolute central authority. Each member state has full sovereignty over their oil industries and any participation in the organization is completely voluntary (Gillespie 1995, p.9). From this we expect that the organization will be unsuccessful at maintaining any type of collusive monopolistic control and competition will emerge out of market demand.

During OPEC’s first decade, they exerted very little influence in the market. However, in 1970-71 the U.S. lower 48 states reached peak oil production as Marian K. Hubbert predicted and TRC had to allow East Texas producers the freedom to produce oil wells at full capacity. Much of this was the result of market interventionist policies of the U.S. Federal government leading up to this period, which will be looked at in the next section. At this time, the Trans-Arabian pipeline, which carried a half million barrels/day load of crude to Mediterranean loading facilities was damaged with the Syrian government unwilling to repair damages leading to a decrease in
global production and the simple growth of demand for oil in Western Europe was simply high (Downey 2009, p.11-12, 298-300, Jones 1981, p.173-174).

In 1970, Kuwait announced a production ceiling (3.86 to 3.0 million barrels/day) in an effort to conserve future rents for generations to come. Kuwait’s announcement is important because it was the 3rd highest producing state, it had the lowest production cost per barrel in the world, and most importantly its joint concession with BP and Gulf was not subject to the “Off-take Agreement” and therefore Kuwaiti oil could supplement the market with swing production capacity (Hartshorn 1993, p.153-155).

Ultimately, OPEC members were able to exert influence in the market starting in 1970 because the market was starting to tighten up particularly in the American market, which had been able to exert de facto control over the market since the 1930’s.

Noticing the tightening market and the ability to exert its newly found political power, Libya challenged the posted price regime set by its concessionaires in 1970 by demanding an increased US$ 0.30 p/barrel (Hartshorn 1993, p.153-155). Libyan protests towards IOC posted prices (of which the governmental rent was based) were not new, prior to the revolution, the monarchy government routinely protested what it considered too low of a posted price set by Exxon. However, during the 1960’s, the market saw an influx of Independent Oil Companies that, unlike the Major Oil companies...

17 The “Off-take Agreement” limited the amount of oil IOC’s could take from Iran and Saudi Arabia (Hartshorn 1993, p.154).
Companies, relied heavily on concessions inside of single countries (Downey 2009, p.10-11, Kaufman 1978, p.104-105).\(^{18}\)

The emergence of this new competition ultimately proved to be beneficial to the producing countries in renegotiating production terms. In Libya, for example, the revolutionary government nationalized independent Chappaqua, which was accused of bribing the government. The new revolutionary government also ordered a May production cut from independent Occidental from 845,447 to 464,565 barrels a day. One by one, oil companies agreed to posted price increases to retain their concessionary rights (Ghanem 1986, p.120-121).\(^{19}\) Realizing the additional rents Libya began receiving, other OPEC members implemented similar measures onto their concessionaires.

In 1971, U.S. President Nixon removed the U.S. Dollar from the gold standard by pulling out of Bretton Woods, allowing the U.S. Treasury and Federal Reserve more freedom to expand the monetary supply. This saw the U.S. dollar lose much of its purchasing power (Hartshorn 1993, p.153-155). Unlike the open transparent oil market

\(^{18}\) The first challenge to the concessionary system was in 1957 by Italian independent ENI by underbidding the Majors with a 25/75 concession with Iran. However, the 50/50 concessionary system remained in tact until the 1970’s (Downey 2009, p.10-11).

\(^{19}\) This should be of no surprise, another example of such state granted monopoly being challenged was that of the Livingstone and Fulton steam boat monopoly granted by New York State in 1807. In 1817, Cornelius Vanderbilt challenged this monopoly by charging more competitive rates than the state backed competitors and broke the monopoly to become a successful American entrepreneur (DiLorenzo, 2006).
of today, the market of the 1970’s was still set on industrial posted prices. As oil producing countries were being paid set posted prices for crude production with weaker U.S. dollars (see Appendix 6) while the spot market experienced an upward surge, producing nations followed the spot market trend in adjusting higher selling prices (Jones 1981, p.174-176). In short, the producing countries were witnessing an arbitrage situation where companies were realizing the total gain in the imbalance between the selling price and the spot price. OPEC nations acted to adjust their prices to make up for this lost revenue stream.

There is an argument that OPEC members controlled the pricing system and thus were able to increase prices against consumers’ will. Writing in the OPEC Review, Al-Janabi (1976) argues that price determination was entirely the producing government’s right to dictate. However, in the case of OPEC in the 1970’s they were not leading the price increases, but actually responding to open market movement through posted price increases.

2.7 U.S. Intervention in the Crude Market to 1970’s

From the time the United States government began controlling the energy industry, many policies have been implemented that created a disincentive for energy producers to expand exploration within the United States. The harshest of these policies have been price controls on natural gas
by the Federal Power Commission. Implemented in the 1950’s, the twenty-
year old program created a price gap between price ceilings (US$ 0.25 per
1000 ft.\(^2\) in 1974), mandated by the government, and the market-clearing
price for the commodity (international market price of US$ 1.00 per 1000 ft.\(^2\)
1974). This created a disincentive to produce natural gas domestically. This
further exacerbated the oil shortage of the 1970’s because natural gas is
largely found in oil reservoirs (Rothbard 1974, p.7).

Other examples of direct or indirect energy price control by the U.S.
Federal government are (1) the vast amounts of crude reserves held by the
U.S. Navy (including Elk Hills in California, Teapot Dome in Wyoming, the
North Slope in Alaska, among others)\(^{20}\), (2) similarly the Federal
Government withholds large portions of western mountain states that
contain some of the world’s largest deposits of shale oil. These areas are
effectively withheld from the market. (3) State governments have levied pro-
rationing, production quotas through the Texas Railroad Commission
production system. This system has effectively held crude off of the market
and thus raised prices. (4) The federal government issued crude import
quotas dating back to the 1950’s, adding to the problems of the pro-rationing
system. (5) Furthermore, production of new refineries and oilfields has been
restricted by environmentalist lobbying; most notably in the Alaskan

\(^{20}\) The Clinton Administration auctioned elk Hills Naval Reserve to Occidental
Petroleum for US$ 3.65 billion in a divestment program in 1998 (U.S.
Department of Energy, 1998). Teapot Dome is well known for a 1922 Federal
investigation of Sec. of Interior Fall who sold leases of the federal oil reserve
for an estimated US$ 400,000. Fall was convicted and spent 1 year in prison
(Edwards 2009).
The effects of not exploiting domestic oil reserves were fully known during the geo-political crises of the 1970's that left an already tight market, almost unbearable. Arab oil embargo was initiated after the Yom Kippur War of October 1973. The 5-10% production cuts observed drove a panic in consumer nations and OPEC members unilaterally ignored the Tehran Agreement (which was set to establish coordinated price increases) because spot prices were rising much higher than what were realized in the proposed posted price increases of the Agreement. OPEC members were able to sell crude for market prices as high as $50 p/barrel in real terms in January 1974; a steep increase from the $14 p/barrel three months earlier (Downey 2009, p.12-16).

However, the only significant production cuts made were from Saudi Arabia and Kuwait. Most Arab oil producing states boycotted crude sales to the United States, but this was only a symbolic protest against U.S. support of

---

21 Alaska for instance is regulated by eight federal agencies (Fish and Wildlife Service, the National Marine Fisheries Service, the Minerals Management Service, the Bureau of Land Management, the Environmental Protection Agency, the Corps of Engineers, the National Oceanic and Atmospheric Agency and the U.S. Coast Guard), three state agencies (the DNR, the ADFG, and the DEC), and the zoning rights given under Title 29 of Alaska statutes to local government authorities. The volume of regulatory agencies has lead to competitive turf wars between regulators; each one seeking to show its dominance over the other agencies and maintaining its relevance, and as a result severe delays occur in the permit process (McBeath 2008, p.197-213).
Israel in light of the occupation of Arab land in Sinai, the Golan Heights, and the Palestinian territories. This event is viewed today, just as it was in 1973, to be responsible for gasoline shortages in the United States. However, this widely accepted narrative of the event is overdramatized, if not a simple fabrication of the economic and historical record.

The fact that Saudi Arabia and Kuwait choose not sell oil to the United States made no difference on the overall oil market. Neither country can control imports being made to the United States, they can only control whom they initially sell to. Oil sold to Europe was resold to the United States or non-OPEC oil supplies replaced OPEC oil supplies in the U.S. During the embargo U.S. oil import levels remained the same as before (Taylor 2003) (see Appendix 7). Saudi oil minister Sheik Yamani admitted in 1973 (quoted in Taylor 2003) that the embargo “did not imply that (Saudi Arabia) could reduce imports to the United States...the world is really just one market. So the embargo was more symbolic than anything else.” Former Secretary of State Henry Kissinger confirms Yamani’s claim in saying that (quoted in Taylor 2003) “the structure of the oil market was so little understood that the embargo became the principle focus of concern... (it) was a symbolic gesture of limited practical importance.”

The reality of the matter is that gas shortages experienced in the United States during the 1970's were the result of price controls imposed by the Federal Government in 1971 (over 2 years before the oil embargo). These price restrictions limited the degree which oil companies could pass
increased oil prices to consumers. As a result, Major Oil Companies lowered imports of foreign oil, stopped selling oil to Independent Oil Companies (in 1973 Independents were exempt from the price controls), and by May of 1973 (five months before the oil embargo), over 1,000 gas stations shut down due to a lack of supply (Taylor 2003). Gasoline was becoming increasingly scarce in the United States well before the embargo began. U.S. energy policy only made the scarcity worse, (1) because it restricted access to oil reserves, (2) because it made it impossible to cover costs in developing areas where access was permitted, and (3) it prohibited the market from making a quick readjustment in light of the increasing oil costs.

2.8 The Crisis of 1986 and the Modern Oil Market

OPEC's inability to effectively govern itself was exposed in the 1980's. In 1981, President Reagan issued Executive Order 12287, which eliminated oil price controls from the U.S. oil market (Executive Order 12287, 1981). Although the price controls undoubtedly had the best intentions to bring low fuel costs to U.S. citizens, by keeping prices artificially low, consumers were not encouraged to divert spending in more important areas of the economy and thus force a sudden disruption in oil dependent sectors of the economy, encourage investment in new production, and find a relatively quick correction (Westly 2000).
During the market correction, the oil industry experienced overproduction and low prices over the next four years. While the market was clearing the malinvestment of the 1970’s, OPEC members were finding it increasingly more difficult to enforce production levels to only meet demand and thus allow crude prices to rise. Without the legal enforcement mechanism that the TRC had, OPEC members simply cheated on their production allotment (Gillespie 1995, p.10).

Former Kuwaiti Oil Minister, Shaikh Ali Khalifah al-Sabah summarized this well in February 1990. Al-Sabah said:

“Everybody who could [exceed the quota] did. Everybody who couldn't complained about it... I would like to see the OPEC quotas scrapped as soon as possible. From a practical standpoint they are already irrelevant, so all that is needed is a recognition of that fact” (quoted in Hartshorn 1993, p.169).

In order not to completely collapse global prices when Iranian oil supply resumed following the revolution of ‘79, Saudi Arabia curbed their oil production from 10.5 million (1978) to 2 million barrels/day (1984). In 1985, Saudi Arabia decided to stop “carry(ing) the burden and protect the price of oil” (Shaikh Yemani quoted in Gillespie 1995, p.10). Despite low prices, Saudi Arabia decided to raise production levels in order to regain market share. They subsequently broke from the posted price selling system and developed a selling regime linked to refined product market prices (Gillespie 1995, p.10). The end result was a 70% drop in the market price to US$ 15 (US$28
in 2009), however the Saudi government maintained its desired rent levels due to the increase in crude sold (Downey 2009, p.17-19).

Ultimately OPEC was unable to maintain a coordinated control over oil prices because of the lacking enforcement of state power over its members (Gillespie 1995, p.10). The inability to legally enforce production quotas allowed competition to freely grow (see Appendix 8). Facing decreased oil revenues during the oil price collapse of the ‘80’s, OPEC members disregarded their collective goals in exchange for individual prosperity, highlighted by Saudi Arabia’s decision, in the face of lost revenue at the expense of other members, to continue its futile attempt to stabilize prices. In 1988 OPEC gave up pricing control entirely by allowing pricing to be linked to spot, forward, and then later to the futures market\textsuperscript{22} (Fattouh 2006b).

3.0 Discussion

3.1 The Mengerian Theory of the Evolving Market

The Mengerian theory that a market evolves from an early stage of monopoly to a competitive market over time can be accepted in regard to the case study presented in this paper. From the first stages of the case study we saw a market with limited producers of the desired good: namely the remnants of the former Standard Oil Empire, BP and Royal Dutch Shell, otherwise known as the Seven Sisters. Over time as the commodity demand grew, the presence of the original dominant firms was challenged by the arrival of new Independents. However from this we see a long period of divergence from the anticipated theory of a continuation of the market development.

For over four decades, the Seven Sisters maintained the status of the primary market shareholders and successfully kept new market entrants from competing against them. This can largely be due to the special government granted privilege given to them, not only inside of their own countries, but also inside the markets of their foreign hosts. Once this relationship was marginalized, first by the influx of crude from the Soviet Union and then by the tightening of production within the United States, competition between major producers and Independents emerged and host governments were able to negotiate more favorable terms with producing firms. However, due to the
inaccessibility to alternative reservoir sources from government restrictions on drilling and other intervening forces in the market, the producing nations of OPEC were able to exercise an alternative form of competitive restriction, which will be analyzed further in the next section.

The evolution of competition in the market has even forced National Oil Companies, once skeptical of private IOC cooperation, to now reach out to their former rivals for their expertise in maximizing their production efficiency in light of their aging oilfields and technological platforms and decreasing revenue streams. None can be a better example of this than Algeria (Addi 1995), which began incorporating more exploration and development programs by international oil companies and partial privatization of state oil company Sonatrach.

However, this competitive evolution is not over and the market will continue to prosper if given the opportunity to reward individual ingenuity. In the last section (3.3) we will analyze ways to help promote this evolutionary process in light of the problems the industry faces today.

3.2 Monopoly as a State Granted Privilege
The second hypothesis, that monopolistic control of the market will be broken in the absence of state protection, can be accepted in our case study. In this study, there were two similar examples of attempted control over prices. In the first example TRC had de facto control over setting prices by controlling United States production quotas through direct governmental granted privilege. The oil producing states coordinated control over production on a federal level and the TRC was able to set production limits until the United States’ oil reserves began peak production levels. Furthermore, the United States and Britain successfully pushed for attractive concessionary agreements in foreign markets. These arrangements were not always beneficial to the host nations and although new market players were emerging, the strength of the state granted privileges successfully fought off the interests of rival, foreign firms from competing in the market.

This system did collapse, but not due to a lack of power exerted from the monopoly granting consumer states. In light of aging domestic oil fields and self-imposed exploration and production restrictions, consuming nations had to end the monopoly in order to maximize sought after resources. It was the futile attempt at central planning that lead to malinvestment domestically, which undermined the monopolistic system from within. When the TRC regime ended, OPEC quickly replaced it in a similarly modeled network. However,
the major difference was the absence of a central, legally binding state, as in the TRC example. OPEC was able to exercise control over the market while it was tight, however, in a loose market, in need of rent income streams to finance domestic public programs, OPEC members were unable to exercise control and competitive forces drove the members to break their collective agreement.

3.3 Reflections on Oil Policy for the Future

3.3.1 Production Spare Capacity

The largest problem we see today in the oil industry is the disappearance of spare production capacity. Throughout the 1990’s spare capacity was ample, but slowly diminishing throughout the decade. OPEC members for example, had nearly 11 million barrels per day spare capacity in 1985, which tightened to just over 1 million in 1990 when the Gulf War broke out. This occurred primarily because Kuwaiti and Iraqi production was cut offline. These levels improved into the new millennium as Russian output increased and global spare capacity surpassed 6 million barrels per day in 2003. The late 1990’s were a bit skewed in terms of oil demand, primarily because of the Asian Financial Crisis of ’97, which saw Asian demand significantly decrease. By 2005, global demand tightened up to near total capacity and not even the efforts of the historically dependent Saudi swing capacity could increase production to meet demand, highlighting the
fact that global producers have been reluctant or unable to develop untapped reserve reservoirs to expand capacity with global demand growth (Downey 2009, p.23-25).

The lack of spare capacity creates the necessity for firms and organizations to add a “security” premium in the way they price oil to hedge against supply disruptions. Secondly, price volatility increases because any disruption in the global production network cannot be made up by increasing supply elsewhere. Thirdly, producers cannot respond to rising prices by increasing production. Lastly, we can witness in times of apparent energy crises, a large momentum towards resource nationalization, which is a concern because nationalized oil companies have been historically worse at exploration and production than private sector players.

This occurred in the 1970's, which followed by a period of privatization when non-nationalized resources were outperforming nationalized resources in an attempt to increase total efficiency. However, since the tightening market in 2003, we have seen a renewed trend of resource nationalization in Venezuela, as well as tax increases and facility seizure in Russia and Peru (among others) (Downey 2009, p.23-24). National Oil Companies are largely controlled through bureaucratic process and are subject to annual budgetary constraints and thus do not seek to maximize business
opportunities when presented like the private sector is able to do

(Fattouh 2006a, p.106-107)

3.3.2 The Asian Market: Growing Demand in the 21st Century

For at least the time being it appears that some of the developing countries are beginning to curtail gasoline subsidies, granted that this maneuver is the result of an inability to continue to tax and redistribute wealth into cheap domestic gasoline prices rather than for the simple purpose of allowing a free market to set its own prices. In 2007, China, India, and Malaysia announced the curbing of gasoline subsidies. India for example subsidizes refined consumer products like gasoline, diesel, kerosene, and liquid natural gas through direct cost fixing as well as through absorbing costs in the state owned oil and refining companies (Timmons 2007) costing billions of dollars annually in the process (Carl 2009, p.222).

Furthermore the government sells oil bonds to further lower costs for consumers. HDFC in Mumbai admits that the current energy policy is “unsustainable in the long term” (quoted in Timmons 2007), however few economists have pointed out the relationship of the oil demand growth and oil subsidies. Demand growth is being led by countries in the developing world that continue to subsidize oil (led by China, India, and increasingly oil producing states in the MENA region), whereas in the major oil consuming countries in the industrialized west, where subsidies are non-existent on oil or refined products, consumers are curbing demand (by free will or by force
through government intervention) (Rostan 2008). However, admittedly the author has doubts that this market cleansing process will materialize and the more likely scenario to combat the artificial demand growth will be immediate investment in exploration and development.

India is an interesting case as an emerging oil consumer. Currently the 5th largest consuming nation, India has only 4% of the world’s total energy resources combined with 17% of the world’s total population. Coal reserves are ample to meet current electricity demand for an estimated 200 years at current levels. However, all estimates predict an increase in demand of electricity, as the estimated 40% of Indian citizens are currently off the power grid gradually are brought into the system. Oil currently plays a limited role in their overall energy portfolio, however, with the automobile industry rapidly expanding, the country is going to have to make a choice in importing higher levels of crude or using their primary electricity fuel, coal, to convert into either alcohol fuel methanol, producing it into synthetic petroleum, or use coal powered electricity plants to power rechargeable power cells. With an automobile industry adding an approximate 1.3 million vehicles a year at an already 5.7 million fleet, this answer will have to be determined sooner, rather than later how to meet this potential growth in oil demand (Carl 2009, p.219-223).

What is certain is that both oil consuming and producing nations alike have to address the production capacity issue. The most logical and efficient way to do this is through the promotion of the free market by reducing the
barriers in place restricting access to domestic oil reserves to allow production to commence. There is no other better way to achieve this than by allowing competitive forces of the market process to allow human ingenuity to flourish and create the means of production to satisfy our energy needs.
Conclusion

In the previous study, we reviewed studies from the various economic schools looking at the concept of monopoly with regard to the oil industry. Highlighting the shortfalls of some of these studies, an alternative view was presented looking at the historical legal significance of monopoly in the Common Law tradition. Building on the classical liberal interpretation of monopoly, we analyzed the various interpretations of monopoly in the Austrian School. Highlighting on the Mengerian theory of the evolving market process and the historical significance of monopoly as a state granted privilege, a case study was built analyzing the historical evolution of the oil industry.

In the case study we saw that the market process tends to become more competitive over time. However, the natural competitive process can be undermined through state intervention in the market, preventing entrepreneurs to emerge when market niches exist. This was highlighted by the use of government granted privilege to detour market entrants from competing against the interests of British concessionaires in Iran and Iraqi Oil Company concessionary zones of the rest of the Middle East (excluding Kuwait) and the overall market influence of the TRC price regime.

However, once the state ended its influence on the market, due to the failure of its own policies, new entrants emerged, which resulted in an increase of Independent Oil Companies able to compete for concessions at more competitive prices for the host governments. Alternatively, in the
absence of state granted privilege, the OPEC pricing regime, effectively a copy of the TRC system, was unable to sustain the same type of market influence that the later system was able to sustain.

In the last section we highlighted the findings of the study and looked at its application for the oil market progressing into the future. The main challenge that the market faces today is a lack of production spare capacity. This is mainly due to the fact that companies are finding it more difficult to access untapped reservoirs and are forced to go into riskier and less cost efficient areas for exploration and production. In order to best confront this problem in the face of tightening global markets and increased demand, most notably from emerging Asian economies, national governments must deregulate their restrictions and streamline their bureaucratic process currently prohibiting companies from accessing proven oil reserves.
Bibliography


Downey, M., 2009. Oil 101. Breinigsville, USA: Wooden Table Press LLC.


Appendixes

APENDIX 1.0

The following survey was conducted online in throughout the month of August 2010. There were 95 total respondents. The target population was American nationals and respondents were asked not to respond if they did not meet this requirement and has a bias that this was honored. The author can verify that at least 87 of the 95 respondents were located in the United States at the time of the survey, 3 in the UK, and the remaining located elsewhere. The sample group was gathered by using a snowball sampling technique, where the survey conductor advertised the survey through acquaintances through e-mail and social media services and asked for voluntary assistance in forwarding the survey on. Only the data labeled 2010 in appendix 1.1-1.6 was conducted during this survey. The remaining data was published in Zentner 1982, p.98-103 and is used for comparison purposes.

Page One

The following survey is in part of dissertation requirements for the MSc. International Management in MENA from the University of London - SOAS. Please answer the following questions to the best of your knowledge. This survey is primarily focused on the perceptions of Americans about the oil industry. I ask that only American nationals participate in the survey. Thank you for your cooperation.

New Page

1.) OPEC stands for the Organization of Petroleum Exporting Countries and consists of the major nations in the world that sell oil to the U.S. and other countries. In general, from what you've heard do you think the existence of OPEC has been good for the United States or bad for the United States?

( ) Good

( ) Don't Know

( ) Bad
2.) People talk a lot about the energy crisis. Which, if any of these things are of particular concern to you with respect to the problem of energy?

( ) High price of energy
( ) Dependence on foreign countries
( ) Shortages occurring in the next two years
( ) Shortages occurring before 2020

3.) What percentage of oil that America used last year was imported from foreign countries?

( ) Less than 10%
( ) 10-20%
( ) 21-33%
( ) 34-50%
( ) 51-75%
( ) Above 75%
( ) I don't know

New Page

4.) Why do you think oil prices rise? pick all that apply.

( ) To make more money, increase profits, greed
( ) In response to increased demand for oil
( ) Need for more money, to meet inflation, increasing costs
( ) For oil producing governments to increase or demonstrate strength and power in the world
( ) For oil producing governments to get more money for domestic programs
( ) Need to conserve energy, petroleum is getting scarce
( ) For oil producing governments to raise money to buy military arms
( ) Other nations are oil dependent on producing states for energy needs
( ) To increase political pressure against Israel
( ) They can get away with it
( ) Don't know
5.) **Thinking about the energy situation in general, which of these if any, do you feel are mainly to blame for high energy prices?** Pick all that apply.

- Oil companies
- Arab oil producers
- The government
- The public
- Gas utilities
- Electric utilities
- Automobile manufacturers
- Heavy industries
- Non-Arab oil producers

7.) **All of the following have been cited as possible causes of energy problems. Which of these, if any do you think are the MOST important causes of America's current energy problem?** Pick all that apply.

- The actions of foreign oil-producing countries in raising prices or cutting production
- The actions of major oil companies, such as holding back supplies in order to boost prices
- Waste of energy by consumers
- Waste of energy by industries in their operations
- The automobile industry is not doing enough to improve gasoline mileage standards
- Natural resources are diminishing generally
- The nation’s failure to adequately fund research and development of alternative energy sources
- The lack of a national energy policy
[ ] Delays in approving construction of energy facilities such as nuclear power plants

[ ] Overly strict environmental standards have restricted production of oil, gas, and coal

[ ] Price controls have reduced incentives to develop new domestic energy sources

[ ] Rising prices from investment speculation

[ ] None of these

Thank You!

Thank you for taking our survey. Your response is very important to us.

1.1 OPEC stands for the Organization of the Petroleum Exporting Countries and consists of the major nations in the world that sell oil to the U.S. and other countries. In general, from what you've heard, do you think the existence of OPEC has been good for the United States or bad for the United States?

<table>
<thead>
<tr>
<th></th>
<th>1979</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>14%</td>
<td>13.7%......13 respondents</td>
</tr>
<tr>
<td>Don't Know</td>
<td>23%</td>
<td>32.6%......31 respondents</td>
</tr>
<tr>
<td>Bad</td>
<td>63%</td>
<td>53.7%......51 respondents</td>
</tr>
</tbody>
</table>

1.2 People talk a lot about the energy crisis. Which, if any of these things are of particular concern to you with respect to the problem of energy?

<table>
<thead>
<tr>
<th>Value</th>
<th>2010 Count</th>
<th>2010 Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependence on foreign countries</td>
<td>51</td>
<td>53.7%</td>
</tr>
<tr>
<td>High Price of Energy</td>
<td>26</td>
<td>27.4%</td>
</tr>
<tr>
<td>Shortages occurring before 2020</td>
<td>17</td>
<td>17.9%</td>
</tr>
<tr>
<td>Shortages occurring in the next two years</td>
<td>1</td>
<td>1.1%</td>
</tr>
</tbody>
</table>
1.3 What Percentage of oil that America used last year was imported from foreign countries?

<table>
<thead>
<tr>
<th>Import proportions</th>
<th>3rd Quarter 1976</th>
<th>3rd Quarter 1977</th>
<th>2nd Quarter 1979</th>
<th>2010 Count</th>
<th>2010 Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10%</td>
<td>4%</td>
<td>2%</td>
<td>4%</td>
<td>1</td>
<td>1.1%</td>
</tr>
<tr>
<td>10-20%</td>
<td>10%</td>
<td>6%</td>
<td>8%</td>
<td>2</td>
<td>2.1%</td>
</tr>
<tr>
<td>21-33%</td>
<td>14%</td>
<td>14%</td>
<td>11%</td>
<td>2</td>
<td>2.1%</td>
</tr>
<tr>
<td>34-50%</td>
<td>24%</td>
<td>24%</td>
<td>23%</td>
<td>11</td>
<td>11.6%</td>
</tr>
<tr>
<td>51-75%</td>
<td>16%</td>
<td>25%</td>
<td>22%</td>
<td>42</td>
<td>44.2%</td>
</tr>
<tr>
<td>76% and above</td>
<td>4%</td>
<td>5%</td>
<td>5%</td>
<td>22</td>
<td>23.2%</td>
</tr>
<tr>
<td>Don't know</td>
<td>28%</td>
<td>23%</td>
<td>28%</td>
<td>15</td>
<td>15.8%</td>
</tr>
<tr>
<td>% imported</td>
<td>37%</td>
<td>42%</td>
<td>48%</td>
<td>51%</td>
<td>51%23</td>
</tr>
</tbody>
</table>

1.4 Why do you think oil prices rise? Pick all that apply.

<table>
<thead>
<tr>
<th>Reason</th>
<th>2010 count</th>
<th>2010 percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>In response to increased demand for oil</td>
<td>68</td>
<td>73.1%</td>
</tr>
<tr>
<td>To make more money, increase profits, greed</td>
<td>60</td>
<td>64.5%</td>
</tr>
<tr>
<td>They can get away from it</td>
<td>43</td>
<td>46.2%</td>
</tr>
<tr>
<td>For oil producing governments to increase or demonstrate strength and power in the world</td>
<td>41</td>
<td>44.1%</td>
</tr>
<tr>
<td>Need for more money, to meet inflation, increasing costs</td>
<td>37</td>
<td>39.8%</td>
</tr>
<tr>
<td>For oil producing governments to raise money to buy military arms</td>
<td>23</td>
<td>24.7%</td>
</tr>
<tr>
<td>Other nations are oil dependent on producing states for energy needs</td>
<td>22</td>
<td>23.7%</td>
</tr>
<tr>
<td>For oil producing governments to get more money for domestic programs</td>
<td>18</td>
<td>19.4%</td>
</tr>
<tr>
<td>To increase political pressure against Israel</td>
<td>14</td>
<td>15.1%</td>
</tr>
<tr>
<td>Need to conserve energy, petroleum is getting scarce</td>
<td>13</td>
<td>14%</td>
</tr>
<tr>
<td>Don't know</td>
<td>2</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

23 The United States consumed an avg. of 18,686,220 b/day in 2009 with an avg. net crude trade deficit of -9,530,470 b/day resulting in a 51% total crude imports (U.S. Energy Information Administration, 2010c).
1.5  Thinking about the energy situation in general, which of these if any, do you feel are mainly to blame for high-energy prices? Pick all that apply.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Companies</td>
<td>72%</td>
<td>63%</td>
<td>64%</td>
<td>73%</td>
<td>61</td>
<td>70.1%</td>
</tr>
<tr>
<td>Arab Oil Producers</td>
<td>40%</td>
<td>49%</td>
<td>57%</td>
<td>67%</td>
<td>37</td>
<td>42.5%</td>
</tr>
<tr>
<td>The Government</td>
<td>65%</td>
<td>49%</td>
<td>51%</td>
<td>46%</td>
<td>60</td>
<td>69%</td>
</tr>
<tr>
<td>The Public</td>
<td>24%</td>
<td>33%</td>
<td>39%</td>
<td>39%</td>
<td>49</td>
<td>56.3%</td>
</tr>
<tr>
<td>Gas Utilities</td>
<td>23%</td>
<td>32%</td>
<td>34%</td>
<td>33%</td>
<td>15</td>
<td>17.2%</td>
</tr>
<tr>
<td>Electric Utilities</td>
<td>21%</td>
<td>33%</td>
<td>36%</td>
<td>32%</td>
<td>14</td>
<td>16.1%</td>
</tr>
<tr>
<td>Automobile Manufacturers</td>
<td>26%</td>
<td>29%</td>
<td>30%</td>
<td>31%</td>
<td>28</td>
<td>32.2%</td>
</tr>
<tr>
<td>Heavy Industry</td>
<td>31%</td>
<td>32%</td>
<td>30%</td>
<td>26%</td>
<td>21</td>
<td>24.1%</td>
</tr>
<tr>
<td>Non-Arab Oil Producers</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>18</td>
<td>20.7%</td>
</tr>
</tbody>
</table>

1.6  All of the following have been cited as possible causes of energy problems. Which of these, if any do you think are the Most important causes of America’s current energy problem? Pick all that apply.

<table>
<thead>
<tr>
<th></th>
<th>1979</th>
<th>2010 Count</th>
<th>2010 Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The actions of foreign oil-producing countries in raising prices</td>
<td>62%</td>
<td>33</td>
<td>37.9%</td>
</tr>
<tr>
<td>The actions of major oil companies, such as holding back supplies in order to boost prices</td>
<td>61%</td>
<td>46</td>
<td>52.9%</td>
</tr>
<tr>
<td>Waste of energy by consumers</td>
<td>58%</td>
<td>52</td>
<td>59.8%</td>
</tr>
<tr>
<td>Waste of energy by industries in their operations</td>
<td>52%</td>
<td>40</td>
<td>46%</td>
</tr>
<tr>
<td>The automobile industry is not doing enough to improve gasoline mileage standards</td>
<td>49%</td>
<td>42</td>
<td>48.3%</td>
</tr>
<tr>
<td>Natural resources are diminishing generally</td>
<td>43%</td>
<td>28</td>
<td>32.2%</td>
</tr>
<tr>
<td>The nation’s failure to adequately fund research and development of alternative energy sources</td>
<td>42%</td>
<td>53</td>
<td>60.9%</td>
</tr>
<tr>
<td>The lack of a national energy policy</td>
<td>32%</td>
<td>35</td>
<td>40.2%</td>
</tr>
<tr>
<td>Delays in approving construction of energy facilities such as nuclear power plants</td>
<td>29%</td>
<td>33</td>
<td>37.9%</td>
</tr>
<tr>
<td>Overly strict environmental standards have restricted production of oil, gas, and coal</td>
<td>27%</td>
<td>25</td>
<td>28.7%</td>
</tr>
<tr>
<td>Price controls have reduced incentives to develop new domestic energy sources</td>
<td>22%</td>
<td>24</td>
<td>27.6%</td>
</tr>
<tr>
<td>None of these</td>
<td>1%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Rising prices from investment speculation</td>
<td>n/a</td>
<td>18</td>
<td>20.7%</td>
</tr>
</tbody>
</table>
Appendix 2  Crude oil sulfur content (% by weight)

<table>
<thead>
<tr>
<th></th>
<th>Crude Oil Sulfur Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sour</td>
<td>&gt;1.5</td>
</tr>
<tr>
<td>Medium sour</td>
<td>0.5- 1.5</td>
</tr>
<tr>
<td>Sweet</td>
<td>&lt;0.5</td>
</tr>
</tbody>
</table>

(Downey 2009, p.35)

Appendix 3  API Density Classifications

<table>
<thead>
<tr>
<th>API Gravity</th>
<th>Crude Density Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;50°</td>
<td>Condensate/Extra-light</td>
</tr>
<tr>
<td>40-50°</td>
<td>Light</td>
</tr>
<tr>
<td>30-39°</td>
<td>Intermediate/medium</td>
</tr>
<tr>
<td>25-29°</td>
<td>Medium/heavy</td>
</tr>
<tr>
<td>&lt;25°</td>
<td>Heavy</td>
</tr>
<tr>
<td>&lt;10°</td>
<td>Extra-heavy</td>
</tr>
</tbody>
</table>

(Downey 2009, p.35)

Appendix 4  Increasing Oil Production & Revenue Stream for IOC’s 1958-61

<table>
<thead>
<tr>
<th>Iran</th>
<th>Production p/day ('000 barrels)</th>
<th>Revenue (US $ millions)</th>
<th>Revenue (UK £ millions)</th>
<th>Iraq</th>
<th>Production p/day ('000 barrels)</th>
<th>Revenue (UK £ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>826.1</td>
<td>247.2</td>
<td>79.9</td>
<td>1958</td>
<td>731.3</td>
<td>297.6</td>
</tr>
<tr>
<td>1959</td>
<td>928.2</td>
<td>262.4</td>
<td>85.6</td>
<td>1959</td>
<td>856.9</td>
<td>313.1</td>
</tr>
<tr>
<td>1960</td>
<td>1,067.7</td>
<td>285</td>
<td>95.1</td>
<td>1960</td>
<td>972.2</td>
<td>333.7</td>
</tr>
<tr>
<td>1961</td>
<td>1,202.2</td>
<td>291.2</td>
<td>94.8</td>
<td>1961</td>
<td>1,000.7</td>
<td>377.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kuwait</th>
<th>Production p/day ('000 barrels)</th>
<th>Revenue (Kuwaiti dinars millions)</th>
<th>Production p/day ('000 barrels)</th>
<th>Revenue (US $ millions)</th>
<th>Saudi Arabia</th>
<th>Production p/day ('000 barrels)</th>
<th>Revenue (US $ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>1,435.8</td>
<td>128.5</td>
<td>1,058.5</td>
<td>297.6</td>
<td>1,411.1</td>
<td>159.8</td>
<td>1,152.7</td>
</tr>
<tr>
<td>1959</td>
<td>1,441.1</td>
<td>159.8</td>
<td>1,152.7</td>
<td>313.1</td>
<td>1,441.1</td>
<td>159.8</td>
<td>1,152.7</td>
</tr>
<tr>
<td>1960</td>
<td>1,691.8</td>
<td>158.6</td>
<td>1,313.5</td>
<td>333.7</td>
<td>1,691.8</td>
<td>158.6</td>
<td>1,313.5</td>
</tr>
<tr>
<td>1961</td>
<td>1,735.0</td>
<td>167.1</td>
<td>1,480.1</td>
<td>377.6</td>
<td>1,735.0</td>
<td>167.1</td>
<td>1,480.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Venezuela</th>
<th>Production p/day ('000 barrels)</th>
<th>Revenue (Bolivars millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>2,604.8</td>
<td>2066</td>
</tr>
<tr>
<td>1959</td>
<td>2,717.0</td>
<td>2791</td>
</tr>
<tr>
<td>1960</td>
<td>2,846.0</td>
<td>2639</td>
</tr>
<tr>
<td>1961</td>
<td>2,919.0</td>
<td>2823</td>
</tr>
</tbody>
</table>

(Ghanem 1986, p.20-21)
Appendix 5  Decreasing oil price trend 1957-1960

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Iranian Heavy</td>
<td>31°</td>
<td>$1.80</td>
<td>$1.62</td>
<td>n/a</td>
</tr>
<tr>
<td>Iraqi Basra</td>
<td>34°</td>
<td>$1.98</td>
<td>$1.80</td>
<td>$1.68</td>
</tr>
<tr>
<td>Iraqi Banias</td>
<td>34°</td>
<td>$2.59</td>
<td>$2.31</td>
<td>$2.15</td>
</tr>
<tr>
<td>Kuwait</td>
<td>31°</td>
<td>$1.85</td>
<td>$1.67</td>
<td>$1.59</td>
</tr>
<tr>
<td>Saudi Arabian Light:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ras Tanura</td>
<td>34°</td>
<td>$2.08</td>
<td>$1.90</td>
<td>$1.80</td>
</tr>
<tr>
<td>Venezuela Bashaquero</td>
<td>16.5°</td>
<td>$2.23</td>
<td>$1.85</td>
<td>n/a</td>
</tr>
</tbody>
</table>

(Ghanem 1986, p.19)

Appendix 6  U.S. Net Imports of Crude Oil (Thousand Barrels per Day)

<table>
<thead>
<tr>
<th>Decade</th>
<th>Year-0</th>
<th>Year-1</th>
<th>Year-2</th>
<th>Year-3</th>
<th>Year-4</th>
<th>Year-5</th>
<th>Year-6</th>
<th>Year-7</th>
<th>Year-8</th>
<th>Year-9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960's</td>
<td>1,007</td>
<td>1,034</td>
<td>1,121</td>
<td>1,126</td>
<td>1,195</td>
<td>1,235</td>
<td>1,221</td>
<td>1,055</td>
<td>1,286</td>
<td>1,405</td>
</tr>
<tr>
<td>1970's</td>
<td>1,310</td>
<td>1,679</td>
<td>2,216</td>
<td>3,242</td>
<td>3,474</td>
<td>4,099</td>
<td>5,279</td>
<td>6,565</td>
<td>6,198</td>
<td>6,284</td>
</tr>
</tbody>
</table>

(Source: U.S. Energy Information Administration, 2010a)

Appendix 7  Inflation and price adjustment for OPEC Oil 1974-79

<table>
<thead>
<tr>
<th>Year</th>
<th>Inflation Index24</th>
<th>Currency Index25</th>
<th>Aggregate Index26</th>
<th>Indexed Price ($/bbl)</th>
<th>OPEC Price ($/bbl)27</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>127</td>
<td>99.6</td>
<td>126.49</td>
<td>13.64</td>
<td>10.78</td>
</tr>
<tr>
<td>1975</td>
<td>139.07</td>
<td>103.02</td>
<td>143.27</td>
<td>15.44</td>
<td>10.72</td>
</tr>
<tr>
<td>1976</td>
<td>147.76</td>
<td>97.53</td>
<td>144.11</td>
<td>15.54</td>
<td>11.51</td>
</tr>
<tr>
<td>1977</td>
<td>157</td>
<td>100.79</td>
<td>158.24</td>
<td>17.06</td>
<td>12.39</td>
</tr>
<tr>
<td>1978</td>
<td>162.1</td>
<td>112.89</td>
<td>182.99</td>
<td>19.73</td>
<td>12.7</td>
</tr>
<tr>
<td>1979</td>
<td>177.5</td>
<td>117.83</td>
<td>209.15</td>
<td>22.55</td>
<td>17.28</td>
</tr>
</tbody>
</table>

(Source: Al-Chalabi 1980, p.95)

24 The Export price index of OECD countries in national currencies
25 The Change of the exchange rate of U.S. dollars vis-à-vis the Geneva 1 basket of currencies
26 The Aggregate Index is constructed on the OED export index and weighted accordingly with intra-member trade. It also considers the movement of the dollar against the Geneva I Agreement basket of currencies against the dollar, the yield highlights a devaluation of the dollar at over 50% during the high inflationary period between 1973 and 1979 (Al-Chalabi 1980, p.94-95).
27 Yearly average price of Arabian Light Crude
### Appendix 8 Non-OPEC and World Production Levels, 1975-88
(million barrels/day)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>8.38</td>
<td>8.25</td>
<td>8.55</td>
<td>8.69</td>
<td>8.97</td>
<td>8.13</td>
<td>0.23</td>
</tr>
<tr>
<td>Canada</td>
<td>1.44</td>
<td>1.32</td>
<td>1.5</td>
<td>1.36</td>
<td>1.47</td>
<td>1.38</td>
<td>-0.33</td>
</tr>
<tr>
<td>USSR</td>
<td>9.47</td>
<td>10.49</td>
<td>11.19</td>
<td>11.68</td>
<td>11.25</td>
<td>12.45</td>
<td>2.1</td>
</tr>
<tr>
<td>China</td>
<td>1.49</td>
<td>1.87</td>
<td>2.12</td>
<td>2.12</td>
<td>2.48</td>
<td>2.74</td>
<td>4.69</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.71</td>
<td>0.98</td>
<td>1.46</td>
<td>2.69</td>
<td>2.74</td>
<td>2.58</td>
<td>9.93</td>
</tr>
<tr>
<td>UK</td>
<td>0.01</td>
<td>0.77</td>
<td>1.57</td>
<td>2.29</td>
<td>2.53</td>
<td>2.25</td>
<td>41.66</td>
</tr>
<tr>
<td>Norway</td>
<td>0.19</td>
<td>0.28</td>
<td>0.4</td>
<td>0.61</td>
<td>0.79</td>
<td>1.17</td>
<td>13.98</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.24</td>
<td>0.42</td>
<td>0.53</td>
<td>0.73</td>
<td>0.89</td>
<td>0.86</td>
<td>9.82</td>
</tr>
<tr>
<td>Oman</td>
<td>0.34</td>
<td>0.34</td>
<td>0.3</td>
<td>0.38</td>
<td>0.49</td>
<td>0.62</td>
<td>4.62</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.1</td>
<td>0.18</td>
<td>0.28</td>
<td>0.37</td>
<td>0.44</td>
<td>0.54</td>
<td>12.97</td>
</tr>
<tr>
<td>Australia</td>
<td>0.41</td>
<td>0.43</td>
<td>0.44</td>
<td>0.42</td>
<td>0.56</td>
<td>0.52</td>
<td>1.83</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.18</td>
<td>0.16</td>
<td>0.17</td>
<td>0.34</td>
<td>0.55</td>
<td>0.58</td>
<td>9</td>
</tr>
<tr>
<td>India</td>
<td>0.17</td>
<td>0.2</td>
<td>0.25</td>
<td>0.48</td>
<td>0.6</td>
<td>0.66</td>
<td>10.43</td>
</tr>
<tr>
<td>Non-OPEC</td>
<td>26.22</td>
<td>28.61</td>
<td>31.89</td>
<td>35.69</td>
<td>37.91</td>
<td>38.25</td>
<td>2.9</td>
</tr>
<tr>
<td>Total OPEC</td>
<td>27.16</td>
<td>31.25</td>
<td>30.93</td>
<td>16.99</td>
<td>15.55</td>
<td>19.68</td>
<td>-2.48</td>
</tr>
<tr>
<td>Total World</td>
<td>53.38</td>
<td>59.86</td>
<td>62.82</td>
<td>52.68</td>
<td>53.46</td>
<td>57.93</td>
<td>0.63</td>
</tr>
</tbody>
</table>

(Mohammad 1992, p.36).

---

28 GR = average annual growth rate